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ABSTRACT

Researchers have long debated on whether note-taking results in improved student performance on tests. Over the years, researchers have tried to verify that note-taking helps students "encode" the information involved and that notes are valuable as materials for review. C. C. Crawford's 1925 study concluded that taking notes was better than not taking notes, that reviewing notes was a key to their impact, and that organizing notes effectively contributes to improved performance on tests. There is growing evidence that note-taking combined with critical thinking facilitates retention and applications of the information. One study found that successful college students engaged in greater integrative processing during note-taking, and that note-taking itself "enhances organizational processing of lecture information." Other research shows that note-taking is an effective learning strategy and that the amount of note-taking is related to academic achievement. While most note-taking research continues to measure the impact of note-taking on recall as measured by tests, there is increasing emphasis on cognitive analyses that may have more explicit instructional implications in the near future. (Twenty-seven references are listed.) (MS)

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Clearinghouse on Reading and Communication Skills

Note-taking: What Do We Know about the Benefits?

by Jeff Beecher

Research on note-taking has generated debates since C. C. Crawford began his studies in the 1920s. Initially the debates centered on whether note-taking resulted in improved student performance on tests. Over the years, researchers have tried to verify that note-taking helps students "encode" the information involved and that notes are valuable as materials for review (Ladas, 1980).

The research findings on whether note-taking promotes encoding have been mixed. Hult *et al.* (1984), for example, found that note-taking does involve semantic encoding; but Henk and Stahl (1985) found that the process of taking notes in itself does little to enhance recall. They found, however, that reviewing notes clearly results in superior recall. Their conclusions were dramatically different from those of Barnett *et al.* (1981), who found "strong support" for the encoding function of note-taking but not for the value of using notes to review material.

Does note-taking promote encoding?

In 1925, Crawford published a study which sought to verify his observation that there is a positive correlation between analyses of college students' lecture notes and their grades on subsequent quizzes. He concluded that taking notes was better than not taking notes, that reviewing notes was a key to their impact, and that organizing notes effectively contributes to improved performance on tests.

After a lull in note-taking research, Ash and Carlton (1953) worked with instructional films and concluded that films lacking necessary pauses and repetitions led to note-taking attempts which actually interfered with listening comprehension and learning. McClendon (1958) used taped lectures and concluded that note-taking doesn't interfere with listening, that no particular note-taking method is best, and that students might as well record as much as possible during note-taking.

In 1970, Howe concluded that students were seven times more likely to recall information one week after it was presented if the information had been recorded in their notes. Howe argued that "the activity of note writing *per se* makes a contribution to later retention...." (p. 63)

Di Vesta and Gray (1972) observed that "note taking" and rehearsal function as learning aids which facilitate learning" (p. 134), while Fisher and Harris (1974) found that students perform better when they are allowed "to encode in the way that they prefer" (p. 386)—using notes or other strategies.

There is growing evidence that note-taking combined with critical thinking facilitates retention and applications of the information. Bretzing and Kulhary (1979) compared note-taking that indicated in-process semantic processing (encoding) with verbatim note-taking and found that subjects who took verbatim notes scored lower on comprehension tests than those who processed information at a higher level while they took notes. Einstein *et al.* (1985) found that successful college students engaged in greater integrative processing during note-taking, and that note-taking itself "enhances organizational processing of lecture information." (p. 522)

Anderson and Armbruster (1986) concluded that there is a benefit to students when the lecture environment permits deep processing while taking notes. Denner (1986) describes a method of using "episodic organizers"—a kind of semantic web or map—to produce a positive encoding effect when seventh-grade subjects were reading complex narrative passages.

Is reviewing notes an effective learning strategy?

The importance of reviewing notes was mentioned briefly by Crawford in 1925. In 1973, Fisher and Harris concluded that "note taking serves both an encoding function and an external memory function [reviewing], with the latter being the more important." (p. 324) Kiewra (1983) found that reorganizing notes *while reviewing* led to higher test achievement. The Cornell system of note-taking encourages this practice (King *et al.*, 1984).

In a report on their study which allowed students to review their notes immediately before a test, Carter and Van Matre (1975) argued that the benefit of note-taking appeared to be derived from the review rather than from the act of note-taking itself. They even went so far as to suggest that reviewing notes may actually cue the student to reconstruct parts of the lecture not initially recorded in the notes. An interesting study by Kiewra (1985) also endorsed the value of review—but not of student notes. He suggested that "Teachers should be aware of students' relatively incomplete note-taking behaviours, and therefore, encouraged *to provide* learners with adequate notes for review." (p. 77; emphasis added)

What does the research suggest to the teacher?

An increasing number of sources try to synthesize the implications of research on note-taking to benefit and advise educators (*e.g.*, Kiewra, 1987). Much of the synthesis relates directly to teacher/instructor presentation of material. Earlier researchers had offered such suggestions: Ash and Carlton (1953) recommended that students be supplied with prepared notes for pre-film and post-film study. Based on his study of college students' notes, Locke (1977) suggested stressing the importance of material that is not written on the board, announcing explicitly the precise role that lectures play in the course, and combating student fatigue by providing a rest break. (p. 98)

In his underlining and note-taking research synthesis for students and teachers, McAndrew (1983) suggested that instructors use a spaced lecture format, insert verbal and nonverbal cues into lectures to highlight structure, write important material on the blackboard, avoid information overload when using transparencies or slides, tell students what type of test to expect, and use handouts that give students room to add notes. Carrier and Titus (1981) asked teachers to devote some class time exclusively to a review period before an exam—an emphasis like that placed on reviewing by Carter and Van Matre (1975), who had also stressed highly organized lectures.

**Over the years the term* note-taking *has been spelled several ways.* Webster's Third New International *(1986) lists it only with the hyphen, but* notetaker *as one word.*

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What are the current research interests?

Note-taking research, along with educational research in general, has begun to concentrate on the cognitive processes of individual learners (Kiewra and Frank, 1985). The relevance of schema theory (Shaughnessy and Evans, 1986) and of metacognition (Tomlinson, 1985) has been studied in recent years.

Kiewra and Benton (1988) have been studying "the relationship between lecture note-taking behaviors and academic ability by using more global measures of ability, such as GPA and predictive achievement test scores. In addition, they have considered a) scores on an information-processing ability test, b) analyses of notes taken during a designated lecture, c) scores on a test based on a lecture, and d) scores on a course exam covering several lectures. They concluded that the "amount of notetaking is related to academic achievement" and the "ability to hold and manipulate propositional knowledge in working memory is related to the number of words, complex propositions, and main ideas recorded in notes." (p. 33)

Thus while most note-taking research continues to measure the impact of note-taking on recall as measured by tests, there is increasing emphasis on cognitive analyses that may have more explict instructional implications in the near future.

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